

CLAIMS

1 1. A method of restoring backed up data, comprising:
2 retrieving a list of objects that are restorable by a client;
3 displaying the list of restorable objects for browsing by a user;
4 submitting a list of restorable objects marked for restoration by the client;
5 executing a restoration of the submitted restorable objects via a remote procedure
6 call such that multiple restore submissions can be made prior to restore execution.

1 2. The method according to claim 1, further including executing multiple restore
2 submissions concurrently.

1 3. The method according to claim 1, further including initiating a restore session for
2 the client.

1 4. The method according to claim 3, further including creating a restore engine
2 process for the retrieving, browsing, submitting and executing of restore objects.

1 5. The method according to claim 4, wherein the client communicates with the
2 restore engine process via remote procedure calls.

1 6. The method according to claim 4, wherein the restore engine process is created by
2 a dispatch daemon on a backup storage system server.

1 7. The method according to claim 4, wherein the restore engine process is terminated
2 upon completion of the restore execution.

1 8. The method according to claim 4, wherein the restore engine process runs on a
2 backup data storage server and further including creating a work item restore process on

3 the backup data server, a server restore process for generating a stream of data to be
4 restored, and a client restore process for receiving the data stream.

1 9. The method according to claim 4, further including detecting and identifying
2 libraries that support associated catalogs of backed up data for processing of backed up
3 data by the restore engine process.

1 10. The method according to claim 9, further including adding a new library
2 supporting new methods of backing up data.

1 11. The method according to claim 9, further including determining object types for
2 backed up data supported by the libraries.

1 12. A method of restoring backed up data, comprising:
2 initiating a restore session for a first client via a dispatch daemon running on a
3 data storage server through a graphical user interface associated with the client;
4 creating a restore engine process in response to a request by the dispatch daemon;
5 establishing a connection between the graphical user interface and the restore
6 engine process;
7 displaying a list of restorable objects for browsing by a user associated with the
8 client via the graphical user interface under the control of the restore engine process;
9 determining restorable objects marked for restoration by the user under control of
10 the restore engine process;
11 storing a list of marked restorable objects submitted by the client to the restore
12 engine process; and
13 executing the restoration of the marked objects under control of the restore engine
14 process independently of the browsing, marking and submitting of the restorable objects.

1 13. The method according to claim 12, wherein the client communicates with the
2 restore engine process via remote procedure calls.

1 14. The method according to claim 12, further including supporting a new backup
2 data method by adding a library corresponding to the new backup data method.

1 15. A data backup and storage system, comprising:
2 a backup storage system for storing backup data from a client storage system
3 under control of a user associated with the client, the backup storage system including
4 a server creating a restore engine process as part of a restore session with a
5 client, the restore engine communicating with the client via remote procedure calls to
6 allow the user to browse restorable objects, mark selected ones of the restorable objects
7 for restoration, submit a list of restorable objects marked by the user, and execute
8 restoration of the submitted list of restorable objects, wherein the restore execution is
9 performed independently of the browse, mark and submit operations such that multiple
10 restore submissions can be made prior to execution of the restore.

1 16. The system according to claim 15, further including a work item restore process, a
2 server restore process, and a client restore process created by the restore engine process to
3 form a restore triangle for executing the restore operation.

1 17. The system according to claim 15, wherein the restore engine process processes
2 libraries upon restore initialization such that libraries can be added to the system for
3 supporting new backup methods.

1 18. The system according to claim 17, further including a dispatch daemon for
2 initiating the restore session.

1 19. The system according to claim 15, further including further restore engine
2 processes corresponding to further restore sessions initiated by additional clients.

- 1 20. The system according to claim 19, further including additional restore triangles for
- 2 executing multiple work item restores concurrently.

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